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MEMOIRS

OF THE

GEOLOGICAL SURVEY

OF

THE UNITED KINGDOM.

Figures and Descriptions

ILLUSTRATIVE OF

BRITISH ORGANIC REMAINS.

DECADE I.-VI

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF HER MAJESTY'S TREASURY.

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1849.

N O T I C E.

PALÆONTOLOGICAL researches forming so essential a part of geological investigations, such as those now in progress by the Geological Survey of the United Kingdom, the accompanying plates and descriptions of British Fossils have been prepared as part of the Geological Memoirs. They constitute a needful portion of the publications of the Geological Survey, and are taken from specimens in the public collections, or lent to the Survey by those anxious to advance this branch of the public service. Although numerous drawings had previously been made, and engravings from them considerably advanced, it was not thought expedient to commence their publication until the large collections of the Survey could be well examined, which a want of the needful space has, until the present time, considerably retarded. This impediment to progress is now being removed, and when the collections can be properly displayed in the New Museum of Practical Geology, in Jermyn Street, it is hoped that the public will have an opportunity of gradually obtaining, in a convenient manner and at small cost, a work illustrating some of the more important forms of animal and vegetable life there preserved, and which have been entombed during the lapse of geological time in the area occupied by the British islands.

The plan proposed to be followed in the work, of which the two Decades now published form a part, is as follows:—

To figure in elaborate detail, as completely as possible, a selection of fossils, illustrative of the genera and more remarkable species of all

classes of animals and plants the remains of which are contained in British rocks ; to select especially such as require an amount of illustration which, to be carried out by private enterprise, would require a large outlay of money, with little prospect of a return, and a long time to accomplish, but which, by means of the staff and appliances necessarily employed on the Geological Survey, can be effected at small cost, and with a rapidity demanded by the publication of the maps and memoirs of the Survey ; thus, it is hoped, affording an aid to those engaged in the sciences with which this work is connected, that they might not otherwise have possessed, and which may materially promote the progress of individual research.

H. T. DE LA BECHE,
Director-General.

Geological Survey Office,
24th May, 1849.

BRITISH FOSSILS.

DECADE THE FIRST.

THE first Decade of representations of British Fossils is devoted to a selection of Echinoderms, of the Orders *Asteriadae* and *Echinidae*.

With the exception of the *Crinoidea* and *Cystidea*, no special monographs have been devoted to the illustration of our fossil species of Echinodermata, notwithstanding their acknowledged importance in a geological point of view. The majority of species found in British strata are unfigured in British works; a very great number are not figured at all, and those of which we possess British figures are, for the most part, delineated either imperfectly or insufficiently for the demands of science in its present state. This is the more remarkable since, for the description and delineation of numerous species, ample materials exist in collections.

Of the following plates, one is devoted to figures of all the Silurian star-fishes as yet discovered in British strata. None of these have hitherto been represented in any work. Their names only, accompanied by short descriptive characters, have appeared in the "Synopsis of British Fossil Asteriadae," contained in the second part of the second volume of the "Memoirs of the Geological Survey of Great Britain." Some remarkable new forms of star-fishes from the Oolites, and all as yet discovered in the London clay, are figured in the second and third plates.

The fourth plate is devoted to a representation of the only fossil as yet discovered of the family *Euryales*, now for the first time described and figured, through the kind co-operation of the Rev. Professor Sedgwick.

In the six following plates a series of illustrations of the British fossil *Echinidæ* is commenced, of the majority of which, even the commonest and those most important for the identification of strata, no good representations are accessible to the student of English fossils. The importance of a knowledge of the members of this family to the explorers of oolitic and cretaceous strata cannot be too strongly insisted on, and their beauty and interest, in a purely Natural History point of view, render them admirable subjects for elaborate delineations.

When the collections accumulated during the course of the progress of the Geological Survey have been thoroughly examined and arranged, new light may be expected, bearing on the details of structure of the species now figured. Additions will consequently be made to the plates from time to time; and it is proposed to issue supplementary figures of the variations of form exhibited by the several species selected as subjects for these decades.

EDWARD FORBES.

May, 1849.

BRITISH FOSSILS.

DECADE I. PLATE II.

OOLITIC SPECIES OF ASTROPECTEN.

[Genus ASTROPECTEN. LINCK. (Sub-kingdom Radiata. Class Echinodermata. Order Asteriadae. Family Asteriæ.) Body stellate, few (five) rayed; no vent; rays flat on both sides, regular. Surface of body and upper sides of arms covered with paxillæ. Ambulacra with two rows of suckers, bordered by spines. Margins of the arms bordered by a double row of conspicuous plates.—The genera STELLARIA of NARDO, and ASTERIAS (restricted) of AGASSIZ, are synonymous.]

FIG. 1.

ASTROPECTEN HASTINGIÆ.

E. FORBES, in "Memoirs of the Geological Survey of Great Britain," vol. ii. part 2, p. 478.

DIAGNOSIS. *A. radiis brevibus, lanceolatis, acutis, lateribus rectis, angulis intermediis obtusis; ossiculis marginalibus quadratis, subæqualibus.*

Description.—Rays short in proportion to the rather broad flat body, triangularly lanceolate, with very straight sides and pointed extremities. The angles formed by their junction with each other and the body are obtuse. Their margins are bordered by regular series of nearly equal square plates, decreasing but slightly as they approach the apex. The length of each ray is about equal to the diameter of the disk. There are about 18 marginal plates in each row. The surface is covered by quadrate tessellations, indicating the arrangement of the plates, which probably, when the animal was alive, bore tufts of paxillæ or coronated spines. The specimen measures two inches in diameter.

Affinities.—The *Astropecten Phillipsii* is probably its nearest fossil ally, but the form and characters of its surface distinguish it conspicuously from any other British member of its genus.

Locality and Geological Position.—From oolitic beds (MARLSTONE) in Yorkshire, precise locality not known. In the cabinet of the Marchioness of Hastings, who has kindly communicated it for description and delineation.

FIG. 2.

ASTROPECTEN PHILLIPSII.

E. FORBES, in "Memoirs of the Geological Survey of Great Britain," vol. ii. part 2, p. 478.

DIAGNOSIS. *A. radiis lanceolatis, lateribus rectis, angulis intermediis valde obtusis; ossiculis marginalibus oblongo-quadratis, spiniferis.*

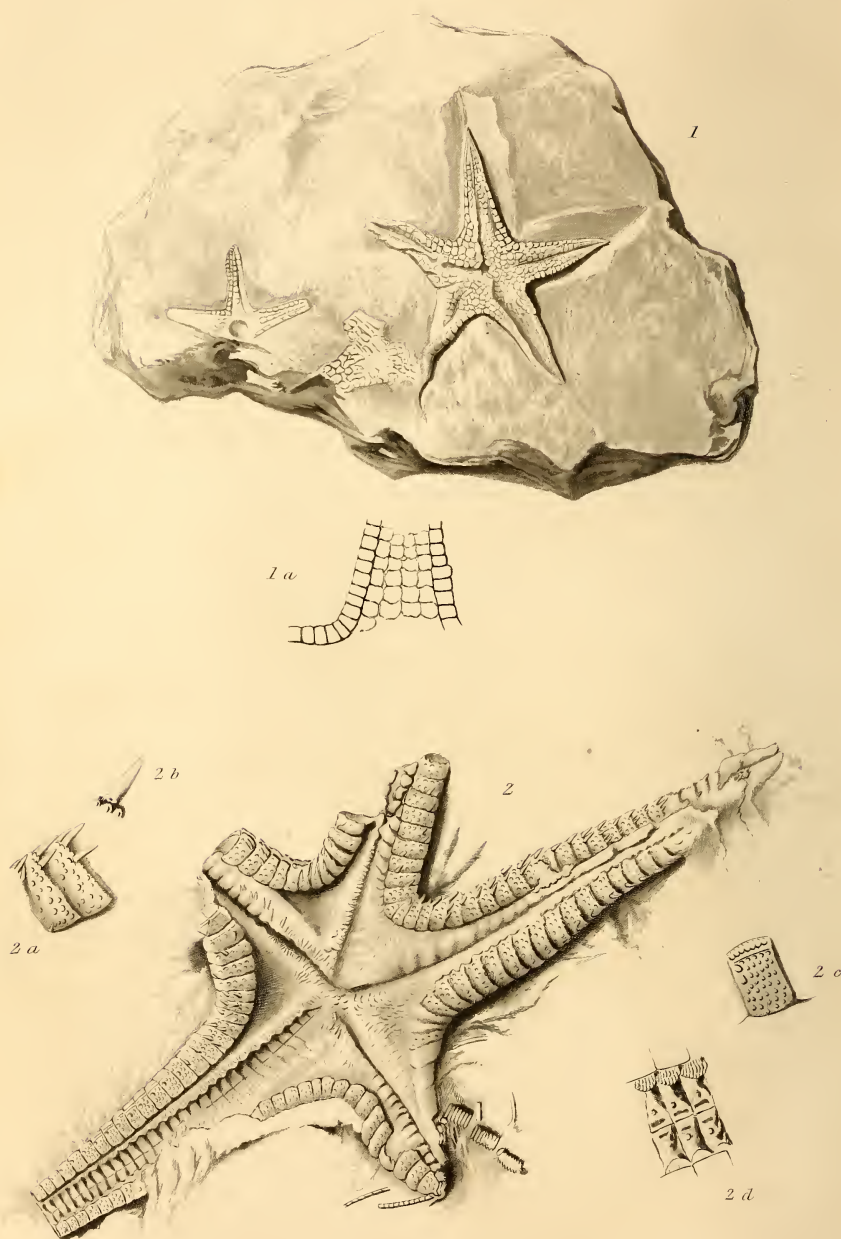
Description.—Disk moderately developed, the arms being in length, compared with its diameter, as one and three-quarters to one. Rays slender, lanceolate, forming very obtuse angles at the junction with each other and the body. Margins of the rays bordered with oblong quadrate plates, which are studded with small tubercles, probably marking the points of attachment of paxillæ; on their edges also are a few scattered linear-lanceolate spines, which are not equal to the breadth of the plate. The ambulacra are bordered with semicircular combs of short spines. The plates composing the skeleton of the body appear to have been oblong. The marginal plates at the angles are narrow, as compared with those of the ray-borders. The diameter of the body is about an inch and two-twelfths. The length of the rays appear to have been about two inches one-twelfth; their breadth, near the junction of the rays with the body, is about seven-twelfths.

Affinities.—This beautiful species bear a striking resemblance to the recent *Astropecten aranciæ* and its allies. No fossil species of this genus, as yet figured, so clearly proves the true generic position of the extinct forms as this.

Locality and Geological Position.—Engraved from a drawing by Mr. J. Phillips of a specimen from the upper sandy beds of FOREST MARBLE, Hinton-lane-end, Yorkshire.

E. FORBES.

April, 1849.



1 ASTROPECTEN HASTINGLEI — Forbes.

2 ——— PHILLIPSII — Forbes.